

REMARKS

Please reconsider the present application in view of the above amendments and the following remarks. Applicant thanks the Examiner for carefully considering the present application.

I. Disposition of Claims

Claims 1-18 were pending in the present application. By way of the Response to the Restriction Requirement of May 13, 2003, claims 1-8 were withdrawn from consideration. Accordingly, claims 9-18 are currently presented for examination. By way of this reply, claims 9, 10, and 15-18 have been amended.

II. Claim Amendments

Claims 9, 10, and 15-18 have been amended to recite that the etching solution does not comprise an amine compound. No new matter has been added by way of these amendments as support for these amendments may be found, for example, on page 2, line 19 – page 3, line 29, page 12, lines 28 – 32, and page 32, lines 12 – 14 of the present application.

III. Information Disclosure Statement

Applicant notes that an Information Disclosure Statement was filed on July 9, 2004. Consideration of this Information Disclosure Statement and indication thereof is respectfully requested.

IV. Acknowledgment of Priority

Applicant notes that the present application claims priority of Japanese Patent Application No. 2000-210918, filed on July 12, 2000, a certified copy of which was filed with the present application. Accordingly, Applicant respectfully requests acknowledgment of the priority claim and receipt of all the priority documents.

V. Rejection(s) Under 35 U.S.C § 103

Claims 9-18 of the present application were rejected under 35 U.S.C. § 103(a) as being unpatentable over Applicant's Admitted Prior Art in view of U.S. Patent No. 6,218,022 issued to Suzuki et al. (hereinafter "Suzuki"), U.S. Patent No. 5,004,777 issued to Hallden-Abberton et al. (hereinafter "Hallden-Abberton"), and/or U.S. Patent No. 4,369,090 issued to Wilson et al. (hereinafter "Wilson"). For the reasons set forth below, this rejection is respectfully traversed.

The present invention is directed to a technique for manufacturing flexible wiring boards. The technique involves bringing an etching solution into contact with a resin layer (of a flexible wiring board) located at a bottom of an opening (of a layer formed over the resin layer) to etch the resin layer. As described on page 2, line 19 – page 3, line 29 of the present application, conventional etching solutions are typically formed of amine components. When an amine compound is part of the etching solution, the amine compound reacts with the polar group of the polyamic acid present in the layer being etched so as to remain in the etched layer. Such amine compound interaction unfavorably affects the working atmosphere and results in ion contamination of the final flexible wiring board. At least partly in order to address the shortcomings incident with

the use of etching solutions formed of amine compounds, the present invention uses an amine-free etching solution. *See Specification, page 3, line 31 – page 4, line 1; page 12, lines 28 – 32; page 32, lines 12 – 14.* Accordingly, amended independent claims 9, 10, and 15-18 of the present application require, in part, that the etching solution not comprise an amine compound.

Applicant's Admitted Prior Art

As described on page 2, line 19 – page 3, line 29 of the present application, conventional etching solutions are formed of amine compounds. With respect to known amine-free solutions, Applicant's Admitted Prior Art states that such solutions have high volatility and flammability such that they adversely affect the working atmosphere in the same manner as amine-based solutions. *See Specification, page 2, line 29 – page 3, line 2.* Thus, Applicant's Admitted Prior Art actually “teaches away” from the use of amine-free etching solutions. Applicant notes that a prior art reference that “teaches away” from the claimed invention is a *significant* factor to be considered in determining obviousness. *See In re Gurley, 27 F.3d 551, 554 (Fed. Cir. 1994)* (emphasis added). Accordingly, because one skilled in the art having benefit of Applicant's Admitted Prior Art would be “taught away” from at least the limitations of the claimed invention related to an amine-free etching solution, it is improper to use Applicant's Admitted Prior Art in an obviousness rejection for purposes of disclosing the desirability of using amine-free etching solutions.

Suzuki

Suzuki fails to disclose all the limitations of the claimed invention. Each of the resin etching solutions disclosed in Suzuki is formed of an amine compound. A first type of resin etching solution disclosed in Suzuki is partly formed of a hydroxyalkylamine (*see* Suzuki, Abstract; column 2, lines 62 – 64; column 3, lines 20 – 25), and a second type of resin etching solution disclosed in Suzuki is partly formed of an aliphatic amine (*see* Suzuki, column 3, lines 65 – 67; column 4, lines 22 – 32). There is no disclosure in Suzuki of an etching solution that does not comprise an amine compound as required by the claimed invention. Accordingly, Suzuki fails to disclose all the limitations of amended independent claims 9, 10, and 15-18 of the present application.

Hallden-Abberton

Like Suzuki discussed above, Hallden-Abberton fails to disclose all the limitations of the claimed invention or supply that which Suzuki lacks. Hallden-Abberton, which discloses imide polymers having relatively-low acid and anhydride levels (*see* Hallden-Abberton, column 1, line 12 – 14), is completely silent as to the use of etching solutions. Thus, Hallden-Abberton necessarily cannot and does not disclose an amine-free etching solution as required by the claimed invention. Accordingly, Hallden-Abberton fails to at least disclose those limitations of amended independent claims 9, 10, and 15-18 of the present application not disclosed by Suzuki.

Wilson

Like Suzuki and Hallden-Abberton discussed above, Wilson fails to disclose all

the limitations of the claimed invention or supply that which Suzuki and Hallden-Abberton lack. Wilson, which discloses a process for etching sloped vias (*see* Wilson, Abstract), uses a quaternary amine base in aqueous alcohol solution for etching. *See* Wilson, column 2, lines 25 – 31; column 6, lines 29 – 43 (disclosing an aqueous-alcoholic solution of tetramethyl ammonium hydroxide as a preferred etchant). Wilson is completely silent as to the use of an etching or etching solution that does not comprise an amine compound as required by the claimed invention. Accordingly, Wilson fails to at least disclose those limitations of amended independent claims 9, 10, and 15-18 of the present application not disclosed by Suzuki and Hallden-Abberton.

In view of the above, because (i) Suzuki, Hallden-Abberton, and Wilson fail to show or suggest all the limitations of the claimed invention and (ii) Applicant's Admitted Prior Art is not properly combinable with Suzuki, Hallden-Abberton, and Wilson due to its "teaching away" from those limitations of the claimed invention not disclosed in Suzuki, Hallden-Abberton, and Wilson, amended independent claims 9, 10, and 15-18 of the present application are patentable over Applicant's Admitted Prior Art, Suzuki, Hallden-Abberton, and Wilson. Dependent claims are allowable for at least the same reasons. Accordingly, withdrawal of this rejection is respectfully requested.

VI. Conclusion

Applicant believes this reply is fully responsive to all outstanding issues and places this application in condition for allowance. If this belief is incorrect, or other issues arise, the Examiner is encouraged to contact the undersigned or his associates at the telephone number listed below.

Please apply any charges not covered, or any credits, to Deposit Account 50-0591 (Reference Number 03310.018001).

Respectfully submitted,

Date: 10/4/01



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